

**WHAT IS CLAIMED IS:**

1. A liquid crystal display comprising:

a first substrate; and

a plurality of driving signal lines formed on the first substrate, the

5 plurality of driving signal lines including a plurality of voltage transmission lines, wherein each voltage transmission line carries one of a plurality of predetermined voltages and the voltage transmission lines are arranged on the first substrate according to the magnitudes of the predetermined voltages carried by the voltage transmission lines.

10 2. The display as recited in claim 1, wherein the voltage

transmission lines are sequentially arranged based on increasing magnitude of the predetermined voltages carried by the voltage transmission lines.

15 3. The display as recited in claim 1, wherein the voltage

transmission lines are sequentially arranged based on decreasing magnitude of the predetermined voltages carried by the voltage transmission lines.

4. The display as recited in claim 1, wherein the driving signal

20 lines further include a plurality of control signal lines and the plurality of control signal lines is positioned adjacent to the plurality of voltage transmission lines.

5        5.        The display as recited in claim 1, wherein the driving signal lines further include a plurality of control signal lines and the plurality of control signal lines is disposed in between a first voltage transmission line and a second voltage transmission line of the plurality of voltage transmission lines.

10        6.        The display as recited in claim 5, wherein a voltage carried by the control signal lines is equal to the predetermined voltage carried by one of the first and second voltage transmission lines.

15        7.        The display as recited in claim 1, wherein one of the plurality of predetermined voltages is one of a common voltage, a gate-off voltage, a gate-on voltage, a ground voltage, and a supply voltage.

20        8.        The display as recited in claim 1, wherein the driving signal lines further include a plurality of control signal lines and the display further comprises:

      a signal controller for generating one of gate control signals and data control signals respectively transmitted via at least one gate control signal line and at least one data control signal line of the plurality of control signal lines;

      a common voltage generator for generating a common voltage transmitted via a common voltage transmission line of the plurality of voltage transmission lines; and

a driving voltage generator for generating one of a gate-on voltage and a gate-off voltage respectively transmitted via a gate-on voltage transmission line and a gate-off voltage transmission line of the plurality of voltage transmission lines.

5

9. The display as recited in claim 1, further comprising:

a gray voltage generator for generating at least one gray voltage transmitted via a gray voltage transmission line of the plurality of voltage transmission lines.

10

10. The display as recited in claim 1, wherein the driving signal lines further include a plurality of control signal lines and the display further comprises:

a gate driver including a gate driving integrated circuit for receiving gate control signals transmitted via at least one gate control signal line of the plurality of control signal lines, and for receiving one of a gate-on voltage and a gate-off voltage respectively transmitted via a gate-on voltage transmission line and a gate-off voltage transmission line of the plurality of voltage transmission lines.

20

11. The display as recited in claim 1, wherein the driving signal lines further include a plurality of control signal lines and the display further comprises:

a data driver including a data driving integrated circuit for receiving data control signals transmitted via at least one data control signal line of the plurality of control signal lines.

5           12.     The display as recited in claim 1, further comprising:

a data driver including a data driving integrated circuit for receiving at least one gray voltage transmitted via a gray voltage transmission line of the plurality of voltage transmission lines.

10           13.     The display as recited in claim 1, further comprising:

an electrode for receiving a common voltage transmitted via a common voltage transmission line of the plurality of voltage transmission lines.

14.     The display as recited in claim 10, wherein the gate driver is

15 disposed on one of the first substrate and a flexible printed circuit film.

15.     The display as recited in claim 11, wherein the data driver is

disposed on one of the first substrate and a flexible printed circuit film.

20           16.     The display as recited in claim 8, wherein one of the signal

controller, the driving voltage generator and the common voltage generator are disposed on a printed circuit board.

17. The display as recited in claim 9, wherein the gray voltage generator is disposed on a printed circuit board

18. The display as recited in claim 1, further comprising:

5 a first electrode and a switching element formed on the first substrate, wherein the first electrode is electrically connected to the switching element;

a plurality of display signal lines including at least one gate line and at least one data line intersecting the at least one gate line, wherein the display signal lines are formed on the first substrate and electrically connected to the switching element;

10 a second substrate spaced apart from the first substrate by a gap, the gap including liquid crystal; and

a second electrode formed on the second substrate.

15 19. The display as recited in claim 18, further comprising:

a gate driver including a gate driving integrated circuit for receiving one of a gate-on voltage and a gate-off voltage via respective gate-on and gate-off voltage transmission lines of the plurality of voltage transmission lines, and for transmitting one of the gate-on voltage and the gate-off voltage to the at least one gate line; and

20 a data driver including a data driving integrated circuit for receiving at least one gray voltage via a gray voltage transmission line of the plurality of voltage transmission lines and for transmitting the at least one gray voltage to

the at least one data line.

20. The display as recited in claim 18, wherein the switching element is a thin film transistor.

5

21. The display as recited in claim 18, further comprising at least one contact assistant connected to an end portion of one of the at least one gate line and the at least one data line.

10

22. The display as recited in claim 1, wherein at least one voltage transmission line of the plurality of voltage transmission lines includes at least one pad at an end thereof for defect testing of display signal lines.

15

23. The display as recited in claim 1, wherein at least one voltage transmission line of the plurality of voltage transmission lines includes at least one pad at an end thereof and a contact assistant connected to the at least one pad.

20

24. The display as recited in claim 1, further comprising:  
a first pad connected to an end of a first voltage transmission line of the plurality of voltage transmission lines, the first voltage transmission line carrying a first voltage of the plurality of predetermined voltages;

a second pad connected to an end of a second voltage transmission line

of the plurality of voltage transmission lines, the second voltage transmission line carrying a second voltage of the plurality of predetermined voltages; and  
an isolated pad interposed between the first and second pads, wherein the isolated pad is electrically connected to at least one redundant driving  
5 signal line and the at least one redundant driving signal line carries a voltage equal to the higher one of the first and second voltages.

25. A liquid crystal display comprising:

a first substrate;

10 a plurality of control signal lines formed on the first substrate;

a plurality of voltage transmission lines formed on the first substrate,  
wherein each voltage transmission line carries one of a plurality of  
predetermined voltages and the voltage transmission lines are arranged on the  
first substrate according to the magnitudes of the predetermined voltages  
15 carried by the voltage transmission lines;

a switching element formed on the first substrate; and

a plurality of display signal lines including at least one gate line and at  
least one data line intersecting the at least one gate line, wherein the display  
signal lines are formed on the first substrate and electrically connected to the  
20 switching element.

26. The display as recited in claim 25, wherein the voltage  
transmission lines are sequentially arranged based on increasing magnitude of

the predetermined voltages carried by the voltage transmission lines.

27. The display as recited in claim 25, wherein the voltage transmission lines are sequentially arranged based on decreasing magnitude of the predetermined voltages carried by the voltage transmission lines.

28. The display as recited in claim 25, wherein the plurality of control signal lines is positioned adjacent to the plurality of voltage transmission lines.

29. The display as recited in claim 25, wherein the plurality of control signal lines is disposed in between a first voltage transmission line and a second voltage transmission line of the plurality of voltage transmission lines.

30. The display as recited in claim 29, wherein a voltage carried by the control signal lines is equal to the predetermined voltage carried by one of the first and second voltage transmission lines.

31. The display as recited in claim 25, wherein one of the plurality of predetermined voltages is one of a common voltage, a gate-off voltage, a gate-on voltage, a ground voltage, and a supply voltage.



32. The display as recited in claim 25, further comprising:

a signal controller for generating one of gate control signals and data control signals respectively transmitted via at least one gate control signal line and at least one data control signal line of the plurality of control signal lines;

5 a common voltage generator for generating a common voltage transmitted via a common voltage transmission line of the plurality of voltage transmission lines; and

a driving voltage generator for generating one of a gate-on voltage and a gate-off voltage respectively transmitted via a gate-on voltage transmission line and a gate-off voltage transmission line of the plurality of voltage  
10 transmission lines.

33. The display as recited in claim 25, further comprising:

a gray voltage generator for generating at least one gray voltage  
15 transmitted via a gray voltage transmission line of the plurality of voltage transmission lines.

34. The display as recited in claim 25, further comprising:

a gate driver including a gate driving integrated circuit for receiving  
20 gate control signals transmitted via at least one gate control signal line of the plurality of control signal lines, and for receiving one of a gate-on voltage and a gate-off voltage respectively transmitted via a gate-on voltage transmission line and a gate-off voltage transmission line of the plurality of voltage

transmission lines.

35. The display as recited in claim 25, further comprising:

a data driver including a data driving integrated circuit for receiving  
5 data control signals transmitted via at least one data control signal line of the  
plurality of control signal lines.

36. The display as recited in claim 25, further comprising:

a data driver including a data driving integrated circuit for receiving at  
10 least one gray voltage transmitted via a gray voltage transmission line of the  
plurality of voltage transmission lines.

37. The display as recited in claim 25, further comprising:

an electrode for receiving a common voltage transmitted via a common  
15 voltage transmission line of the plurality of voltage transmission lines.

38. The display as recited in claim 25, wherein the gate driver is  
disposed on one of the first substrate and a flexible printed circuit film.

20 39. The display as recited in claim 35, wherein the data driver is  
disposed on one of the first substrate and a flexible printed circuit film.

40. The display as recited in claim 32, wherein one of the signal

controller, the driving voltage generator and the common voltage generator are disposed on a printed circuit board.

41. The display as recited in claim 33, wherein the gray voltage  
5 generator is disposed on a printed circuit board

42. The display as recited in claim 1, further comprising:  
a first electrode formed on the first substrate, wherein the first  
electrode is electrically connected to the switching element;

10 a second substrate spaced apart from the first substrate by a gap, the  
gap including liquid crystal; and

a second electrode formed on the second substrate.

43. The display as recited in claim 25, further comprising:

15 a gate driver including a gate driving integrated circuit for receiving  
one of a gate-on voltage and a gate-off voltage via respective gate-on and gate-  
off voltage transmission lines of the plurality of voltage transmission lines,  
and for transmitting one of the gate-on voltage and the gate-off voltage to the  
at least one gate line; and

20 a data driver including a data driving integrated circuit for receiving at  
least one gray voltage via a gray voltage transmission line of the plurality of  
voltage transmission lines and for transmitting the at least one gray voltage to  
the at least one data line.

44. The display as recited in claim 25, wherein the switching element is a thin film transistor.

5           45. The display as recited in claim 25, further comprising at least one contact assistant connected to an end portion of one of the at least one gate line and the at least one data line.

10           46. The display as recited in claim 25, wherein at least one voltage transmission line of the plurality of voltage transmission lines includes at least one pad at an end thereof for defect testing one of the at least one gate line and the at least one data line.

15           47. The display as recited in claim 25, wherein at least one voltage transmission line of the plurality of voltage transmission lines includes at least one pad at an end thereof and a contact assistant connected to the at least one pad.

20           48. The display as recited in claim 25, further comprising:  
a first pad connected to an end of a first voltage transmission line of the plurality of voltage transmission lines, the first voltage transmission line carrying a first voltage of the plurality of predetermined voltages;  
a second pad connected to an end of a second voltage transmission line

of the plurality of voltage transmission lines, the second voltage transmission line carrying a second voltage of the plurality of predetermined voltages; and

an isolated pad interposed between the first and second pads, wherein the isolated pad is electrically connected to at least one redundant driving  
5 signal line and the at least one redundant driving signal line carries a voltage equal to the higher one of the first and second voltages.

49. An electronic device with conductive lines for transmitting electrical signals comprising:

10 a substrate; and

a plurality of voltage transmission lines formed on the substrate, wherein each voltage transmission line carries a voltage and the voltage transmission lines are arranged on the substrate according to the magnitudes of the voltages carried by the voltage transmission lines.

15